# Appendix B

# Air Quality Improvement Plan

# Air Quality Improvement Plan (AQIP)

## Otay Land Company Village 9

December 2013
DRAFT

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# 1. EXECUTIVE SUMMARY

*Purpose*

The purpose of this AQIP is to provide an analysis of air pollution impacts that would result from development of Village 9 and to demonstrate how the design for Village 9 reduces vehicle trips, maintains or improves traffic flow, reduces vehicle miles traveled, and reduces direct or indirect greenhouse gas (GHG) emissions. This AQIP also demonstrates how Village 9 has been designed consistent with the City's Green Building and Increased Energy Efficiency Standards, (CVMC 15.12 and 15.26.030) and represents the best available design in terms of improving energy efficiency and reducing GHG emissions. Greenhouse gas emissions include gases such as Carbon Dioxide ($CO_2$), Methane ($CH_4$), and Nitrous Oxide ($N_20$). They occur both naturally, and are produced by human activities, such as by automobile emissions and emissions from production of electricity to provide power to homes and businesses. These gases prevent heat from escaping the earth's atmosphere, while allowing in sunlight, which has the affect of warming the air temperature. Applicable action measures contained in the City's Carbon Dioxide Reduction Plan are also addressed.

*Plan Design*

Otay Ranch is a 23,000-acre master-planned community and includes a mix of land uses within 20 villages and/or planning areas. Village 9 is located at the southerly edge of the Otay Valley Parcel of Otay Ranch just east of State Route (SR-125) near the intersection of Eastlake Parkway and Hunte Parkway. Key aspects that influenced the design of Village 9 relative to pedestrian, transit, and automobile circulation, and urban design, include the future University and Regional Technology Park (RTP) located to the east and the Eastern Urban Center (EUC) planned to the north. The heart of the Village is the Town Center. It is envisioned that this core area provide for the needs of the community by featuring a blend of shopping, restaurant, civic, institutional, educational, recreational, entertainment, personal service, and residential opportunities. The Town Center will provide a viable and intensified mixture of uses that will draw university students and faculty, residents, business owners, RTP employees, and visitors. Intensified residential densities and commercial uses at the heart of the community enhance and support transit use, promote walkability, and create vibrant commercial and public spaces that promote social interaction and create a strong community identity.

The Village 9 SPA plan includes 323.1 gross acres and a range of allowable uses. The following land uses represent the maximum allowed per the Village 9 SPA plan:

- Up to 4,000 residential dwelling units,
- 1,200,000 square feet of commercial office,
- 300,000 square feet of retail,
- 27.5 acres of park,
- 9.6 acres of open space,
- Two elementary schools, and
- 5 acres of community purpose facilities.

The overall plan is organized such that development intensity decreases from the EUC and Main Street, south toward the Town Center, and finally south toward Otay Valley Road and Otay River Valley. Village 9 includes community commercial uses and multi-family opportunities for affordable and new generational housing in the intensified Town Center, the opportunity for additional high density affordable housing and neighborhood commercial uses south and east of the Town Center, and attached and detached single family housing south of Otay Valley Road. This broad spectrum of housing and commercial opportunities is intended to meet the anticipated demands of students, faculty, and professionals associated with the adjacent University and RTP as well as the general population.

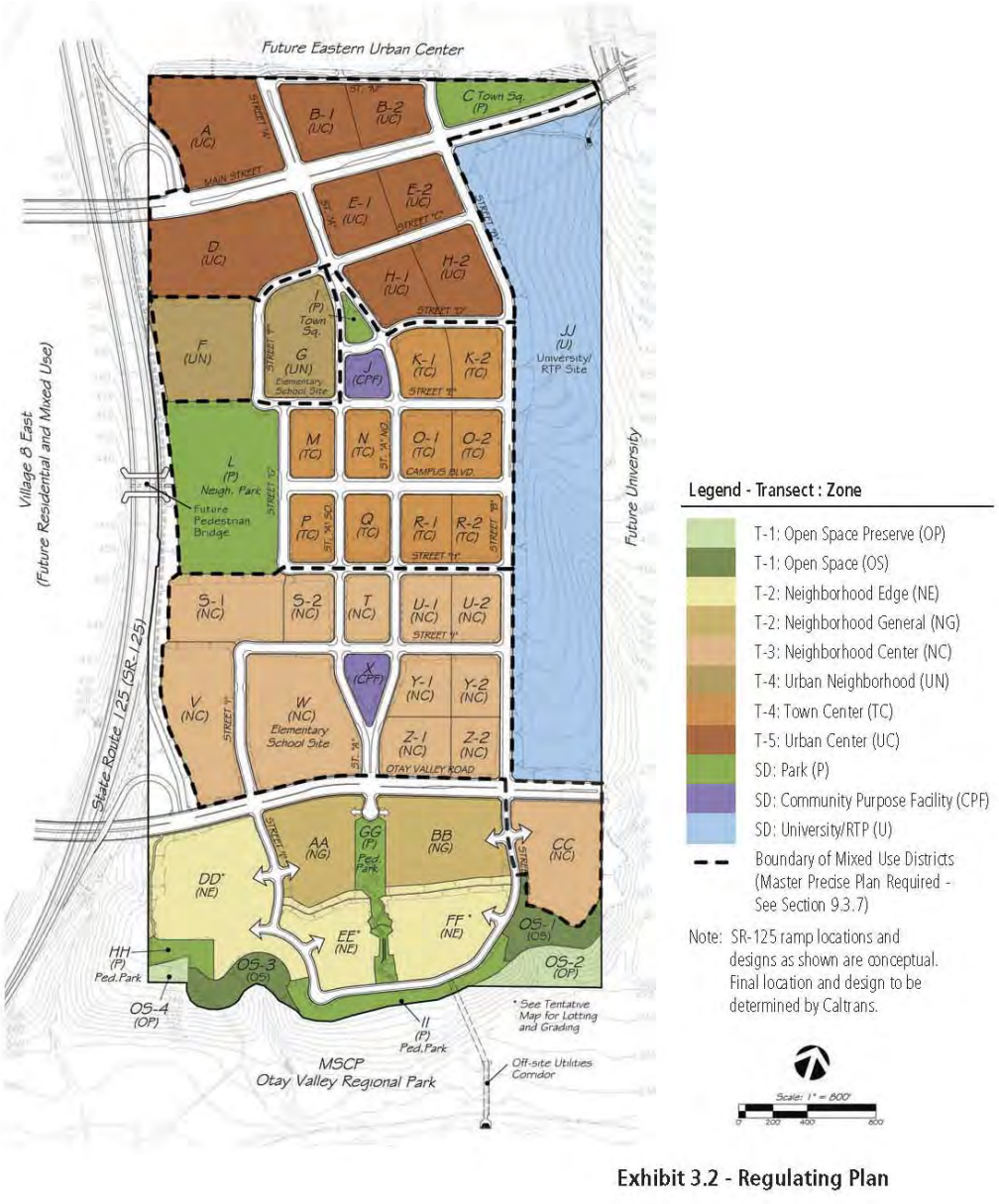


***Figure 1: SPA Regulating Plan***

Class II bicycle facilities are planned along all circulation element roadways through Village 9 except on Street B. Sidewalks will be provided throughout Village 9. Except for Main Street, Otay Valley Road, and B Street, all roadways internal to the Village are designed to local street standards with speed limits of 25 to 35 mph. Slow traffic speeds are conducive to both walking and bicycling and provide the necessary linkage to the regional bicycle circulation network.

Sidewalks will be provided through Village 9 along with bulb-outs at key locations to reduce pedestrian crossing distances. In addition, the land uses designated in the Town Center (adjacent to the couplet) are intended to be pedestrian and bicycle friendly. With design travel speeds of 35 mph along Street "A" through the couplet, the roadways are designed to provide a comfortable walking environment. On-street parking will be provided on many of the internal streets to help reduce traffic speeds and buffer the pedestrian from traffic flow.

A pedestrian and bicyclist bridge will be constructed over SR-125 that will improve the pedestrian and bicycle linkages between Village 8 East and Village 9. The bridge is located approximately midway between Otay Valley Road and Main Street and will connect in Village 9 at the proposed community park located along the western boundary of the Village. This bridge is intended to reduce the reliance on passenger vehicle trips and encourage walking and bicycling between the two communities and throughout the ranch.

Village 9 is transit ready. In conformance with General Plan policy, public transportation is an integral part of Otay Ranch. The Village 9 plan provides for potential transit services with options available depending on what future transit service program is implemented. A public transit line and stops are integrated into the plan and are located within or in close proximity to the highest intensity neighborhoods and the future University campus.

The current regional transit plan includes transit lines on East "H" Street, East Palomar Street, La Media Road, and Eastlake Parkway. Transit stops are planned to be located approximately five to six miles apart with the Village 9 stop planned near the intersection of Campus Boulevard and Street B. In conformance with the General Plan, a future transit line also is planned on Main Street. The actual transit plan will be developed in conjunction with the San Diego Association of Governments (SANDAG). Specific access points as well as the internal circulation for bicycle riders and pedestrians and exact roadway configurations will be approved during the Tentative Tract Map (TM) process.

An additional means to reduce GHG emissions is the use of Low Speed Vehicles (LSVs). LSVs are envisioned as alternative modes of travel within and between the Otay Ranch villages. In Village 9, LSVs may travel on all village streets with a maximum travel speed of 35 mph. Except for Main Street and Otay Valley Road, all village streets are planned for maximum travel speeds of 25 to 35 mph.

Vehicle trip generation is based on the project traffic study, which was prepared by RBF Consulting (2013). The projected Average Daily Trips (ADT) rate for the Village 9 is 34,067 trips. The projected ADT accounts for internal capture from mixed-use development and the reduction in vehicle trips compared to similar developments that do not provide access to transit. Potential

bus stops are proposed in Village 9 in the Town Center and along Otay Valley Road. The projected ADT also takes into account the Transportation Demand Management (TDM) program included in the Village 9 SPA Plan. The TDM includes strategies to reduce vehicle trips and miles traveled and to design a multi-modal transportation system, and establishes a Transportation Management Association to provide transportation services in a particular area to reduce vehicle miles and implement other TDM strategies.

According to the Otay Ranch Village 9 Air Quality Technical Report dated May 2013 prepared by Atkins, the project trip generation rates account for the approximately 40 percent reduction in vehicle trips that would occur as a result of the mixed-use areas, transit use, and availability of pedestrian and bicycle facilities proposed as part of the SPA plan. In addition, future vehicular emissions may be lower than estimated due to increasingly stringent California fuel efficiency requirements. As determined by SANDAG as part of the GPA/GDPA EIR process, the average daily trip length for the Village 9 will be 5.08 miles (less than the regional average trip length of 5.8 miles).

The Village 9 SPA Plan incorporates several additional features into the site design that promote alternative transportation use, reduce traffic congestion, encourage energy efficiency, and reduce area source pollutants. These measures include the following:

1. Provide shower and locker facilities at offices with more than ten occupants to encourage bicycle use.
2. Design parking lots to promote use of mass transit and car pools.
3. Synchronize the traffic lights included as part of an individual development project with previously installed traffic lights in order to reduce traffic congestion.
4. Utilize solar heating technology as practical. Generally, solar panels can be cost-effectively used to heat water for domestic use and for swimming pools. Advances in solar technology in the future may make other applications appropriate.
5. Enhance energy efficiency in building designs and landscaping plans.
6. Identify an environmental coordinator to be responsible for education and disseminating information on ridesharing and/or mass transit opportunities, recycling, energy conservation programs, etc.
7. Install only electric or natural gas fireplaces in new development. No wood burning fireplaces are permitted.
8. When siting sensitive land uses such as residences, schools, day care centers, playgrounds and medical facilities the recommendations set forth in Table 1-1 of California Air Resources Board's (CARB) Land Use and Air Quality Handbook (CARB 2004) will be use as a guideline. Specifically, new sensitive uses would not be located within 50 feet of any typical-sized gas station (one that has a throughput of less than 3.6 million gallons per year). No gas stations with a throughput of 3.6 million gallons per year or greater shall be developed within Village 9.

Air pollutant emission sources during project construction include exhaust and particulate emissions generated from construction equipment; fugitive dust from site preparation, grading, and excavation activities; and volatile compounds that evaporate during site paving and painting of structures. Village 9 is approximately 273 acres; however, only 263.5 acres of the site would

be disturbed during construction. The remaining area consists of areas designated for open space. A total of 6.7 acres would be disturbed off-site for the construction of the sewer and storm drain corridor and access road (1.1 acres) and grading required due to topography, fuel modification, and drainage requirements (5.6 acres). The total disturbance area would be 270.2 acres.

Implementation of mitigation measures would reduce significant emissions of Nitrous Oxides ($NO_x$), Particulate Matter ($PM_{10}$, and $PM_{2.5}$), during grading and surface improvements, but not to a less than significant level resulting in potentially significant impacts. Actual emissions may be less than calculated by the URBEMIS model (a software model designed to estimate air emissions from land use development projects) since this model does not take into account additional standards adopted by California Air Resources Board (CARB) after 2007 and assumed a worst-case scenario.

In conclusion, there are construction and operation air quality impacts anticipated during either the construction or operation phases of the project after all mitigation measures have been utilized. Village 9 will be consistent with the City's General Plan, as amended. However, the growth projections for the Regional Air Quality Strategy (RAQS) were based on the 2005 General Plan. Even though the proposed project would be consistent with all the applicable transportation and area source control measures proposed in the RAQS to reduce emissions in the region, the project exceeds the growth projections in the RAQS and would exceed the significant thresholds for ozone precursors and particulate matter during construction and operation for the San Diego Air Basin.

## 2. INTRODUCTION

The purpose of this AQIP is to provide an analysis of air pollution impacts that would result from development of Village 9 and to demonstrate how the design for Village 9 reduces vehicle trips, maintains or improves traffic flow, reduces vehicle miles traveled, and reduces direct or indirect Greenhouse Gas (GHG) emissions. This AQIP also demonstrates how Village 9 has been designed consistent with the City's Green Building and Increased Energy Efficiency Standards, (CVMC 15.12 and 15.26.030) and represents the best available design in terms of improving energy efficiency and reducing GHG emissions. Greenhouse gas emissions include gases such as Carbon Dioxide ($CO_2$), Methane ($CH_4$), and Nitrous Oxide ($N_20$). They occur both naturally, and are produced by human activities, such as by automobile emissions and emissions from production of electricity to provide power to homes and businesses. These gases prevent heat from escaping the earth's atmosphere, while allowing in sunlight, which has the affect of warming the air temperature. Applicable action measures contained in the City's Carbon Dioxide ($CO_2$) Reduction Plan are also addressed.

As the result of rapid development not keeping pace with the demand for facilities and improvements, the City Council adopted Growth Management policy measures that would

prohibit new development to occur unless adequate public facilities, improvements and environmental quality of life standards were put in place. The purpose of the City of Chula Vista's Growth Management Ordinance (CVMC Chapter 19.09) is to provide the following:

1. Provide quality housing opportunities for all economic sections of the community;
2. Provide a balanced community with adequate commercial, industrial, recreational and open space areas to support the residential areas of the City;
3. Provide that public facilities, services and improvements meeting City standards exist or become available concurrent with the need created by new development;
4. Balance the housing needs of the region against the public service needs of Chula Vista residents and available fiscal and environmental resources;
5. Provide that all development is consistent with the Chula Vista general plan;
6. Prevent growth unless adequate public facilities and improvements are provided in a phased and logical fashion as required by the general plan;
7. Control the timing and location of development by tying the pace of development to the provision of public facilities and improvements to conform to the City's threshold standards and to meet the goals and objectives of the growth management program;
8. Provide that the air quality of the City of Chula Vista improves from existing conditions;
9. Provide that the City of Chula Vista conserves water so that an adequate supply be maintained to serve the needs of current and future residents.

The objective of this AQIP is to fulfill the City of Chula Vista's Growth Management policy to provide that the air quality of the City of Chula Vista improves from existing conditions. This AQIP is provided in accordance with CVMC 19.09.950B. The Growth Management Ordinance requires that no application for a SPA Plan or Tentative Map shall be deemed complete or accepted for review unless an AQIP is provided and approved as part of the approval of the SPA Plan or Tentative Map by the City. The AQIP has been prepared based on the best available design practices and also serves to implement several of the key aspects of the City's $CO_2$ Reduction Plan, the Green Building Standards (CVMC Chapter 15.12) and the energy efficiency requirements (CVMC 15.26.030).

## 3. PURPOSE & GOALS

There are a number of actions that federal, state, and local jurisdictions have taken to improve air quality, increase energy efficiency, and reduce GHG emissions. This section summarizes those actions.

*Federal, State, and Local Rules and Regulations Related to Air Quality*

Air quality is defined by ambient air concentrations of specific pollutants determined by the Environmental Protection Agency (EPA) to be of concern with respect to the health and welfare of the public. The subject pollutants monitored by the EPA include the following:

- Carbon Monoxide (CO),
- Sulfur Dioxide ($SO_2$),
- Nitrogen Dioxide ($NO_2$),
- Ozone ($O_3$),

- Respirable 10- and 2.5-micron particulate matter ($PM_{10}$, $PM_{2.5}$),
- Volatile Organic Compounds (VOC),
- Reactive Organic Gasses (ROG),
- Hydrogen Sulfide ($H_2S$),
- Sulfates,
- Lead, and
- Visibility reducing particles (VRP).

The EPA has established ambient air quality standards for these pollutants. These standards are called the National Ambient Air Quality Standards (NAAQS). The California Air Resources Board (CARB) subsequently established the more stringent California Ambient Air Quality Standards (CAAQS). Both sets of standards are shown in Figure 2 on the following page. Areas in California where ambient air concentrations of pollutants are higher than the state standard are considered to be in "non-attainment" status for that pollutant.

Regulation of air emissions from non-mobile sources within San Diego County has been delegated to the San Diego County Air Pollution Control District (APCD). As part of its air quality permitting process, the APCD has established thresholds for the preparation of Air Quality Impact Assessments (AQIAs) and/or Air Quality Conformity Assessments (AQCAs). APCD has also established an "emissions budget" or Regional Air Quality Strategy (RAQS) for the San Diego Air Basin. This budget takes into account existing conditions, planned growth based on general plans for cities within the region, and air quality control measures implemented by the APCD.

The applicable standards are shown in Figure 3 on page 9.

| Pollutant | Averaging Time | California Standards [1] | Federal Standards [2] | |
|---|---|---|---|---|
| | | Concentration[3] | Primary [3, 4] | Secondary [3, 5] |
| Ozone ($O_3$) | 1-hour | 0.09 ppm (180 $\mu g/m^3$) | -- | Same as Primary Standards |
| | 8-hour | 0.070 ppm (137 $\mu g/m^3$) | 0.075 ppm (147 $\mu g/m^3$) | |
| Respirable Particulate Matter ($PM_{10}$) | 24 Hour | 50 $\mu g/m^3$ | 150 $\mu g/m^3$ | Same as Primary Standards |
| | Annual Arithmetic Mean | 20 $\mu g/m$ | -- | |
| Fine Particulate Matter ($PM_{2.5}$) | 24 Hour | No Separate State Standard | 35 $\mu g/m^3$ | Same as Primary Standards |
| | Annual Arithmetic Mean | 12 $\mu g/m^3$ | 15 $\mu g/m^3$ | |
| Carbon Monoxide (CO) | 8-hour | 9 ppm (10 $mg/m^3$) | 9 ppm (10 $mg/m^3$) | None |
| | 1-hour | 20 ppm (23 $mg/m^3$) | 35 ppm (40 $mg/m^3$) | |
| Nitrogen Dioxide ($NO_2$) | Annual Arithmetic Mean | 0.030 ppm (57 $\mu g/m^3$) | 53 ppm (100 $\mu g/m^3$)[6] | Same as Primary Standard |
| | 1-hour | 0.18 ppm (470 $mg/m^3$) | 100 ppb (188 $\mu g/m^3$)[6] | None |
| Sulfur Dioxide ($SO_2$) | 24 Hour | 0.04 ppm (105 $\mu g/m^3$) | -- | -- |
| | 3 Hour | -- | -- | 0.5 ppm (1300 $\mu g/m^3$)[7] |
| | 1-hour | 0.25 ppm (655 $\mu g/m^3$) | 75 ppb (196 $\mu g/m^3$)[7] | -- |
| Lead[8] | 30 Day Average | 1.5 $\mu g/m^3$ | -- | -- |
| | Calendar Quarter | -- | 1.5 $\mu g/m^3$ | Same as Primary Standard |
| | Rolling 3-Month Average[9] | -- | 0.15 $\mu g/m^3$ | |
| Visibility Reducing Particles | 8-hour | Extinction coefficient of 0.23 per kilometer - visibility of 10 miles or more due to particles. | No Federal Standards | |
| Sulfates | 24 Hour | 25 $\mu g/m^3$ | No Federal Standards | |
| Hydrogen Sulfide | 1-hour | 0.03 ppm (42 $\mu g/m^3$) | No Federal Standards | |
| Vinyl Chloride[8] | 24 Hour | 0.01 ppm (26 $\mu g/m^3$) | No Federal Standards | |

[1] California standards for ozone, CO, $SO_2$ (1-hour and 24-hour), $NO_2$, $PM_{10}$, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, lead, hydrogen sulfide, and vinyl chloride standards are not to be equaled or exceeded.

[2] National standards, other than 1-hour ozone, 8-hour ozone, 24-hour $PM_{10}$, 24-hour $PM_{2.5}$, and those based on annual averages, are not to be exceeded more than once a year. The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the annual fourth-highest daily maximum 8-hour concentrations is below 0.08 ppm. The 24-hour $PM_{10}$ standard is attained when the 3-year average of the 99$^{th}$ percentile 24-hour concentrations is below 150 $\mu g/m^3$. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of the 98$^{th}$ percentile 24-hour concentrations is below 65 $\mu g/m^3$.

[3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parenthesis are based on a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar). All measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury; parts per million (ppm) in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[5] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[6] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010). Note that the EPA standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively.

[7] On June 2, 2010, the U.S. EPA established a new 1-hour SO2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. EPA also proposed a new automated Federal Reference Method (FRM) using ultraviolet technology, but will retain the older pararosaniline methods until the new FRM have adequately permeated State monitoring networks. The EPA also revoked both the existing 24-hour SO2 standard of 0.14 ppm and the annual primary SO2 standard of 0.030 ppm, effective August 23, 2010. The secondary SO2 standard was not revised at that time; however, the secondary standard is undergoing a separate review by EPA. Note that the new standard is in units of parts per billion (ppb). California standards are in units of ppm. To directly compare the new primary national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

[8] The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[9] National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Source: ARB 2010a.

***Figure 2: Ambient Air Quality Standards Matrix***

| Pollutant | Construction Emissions (pounds/day) | Operation Emissions (pounds/day) |
|---|---|---|
| Carbon Monoxide (CO) | 550 | 550 |
| Reactive organic gases (ROG)(1) | 75 | 55 |
| Nitrogen Oxides ($NO_x$) | 100 | 55 |
| Sulfur Oxides ($SO_x$) | 150 | 150 |
| Respirable Particulate Matter ($PM_{10}$) | 150 | 150 |
| Fine Particulate Matter ($PM_{2.5}$) | 55 | 55 |
| Reactive organic gases are also sometimes referred to as volatile organic compounds.<br>Source: SCAQMD 2010 | | |

***Figure 3: Thresholds of Significance for Air Quality Impacts***

*Summary of Energy Efficiency Standards*

Title 24, Part 6 of the California Building Standards Code regulates energy uses including space heating and cooling, hot water heating, and ventilation. The energy code allows new buildings to meet a "performance" standard that allows a builder to choose the most cost effective energy saving measures to meet the standard. These choices may include the following:

- Added insulation,
- Radiant barriers,
- Cool roofs,
- Improved HVAC systems,
- Alternative heating and cooling systems,
- More efficient water heating systems, and
- More efficient light systems.

The energy code was updated in 2008 to continue to reduce the amount of energy needed for new buildings. This update reduced the electricity needed to operate central air conditioning for residential uses between 19.7% and 22.7% and the natural gas needed to operate gas water heaters between 7% and 10%. For non-residential buildings, the most recent update reduced the electricity needed to operate heating equipment 37.2%, cooling equipment 8.3% and interior lighting 5.9%. The non-residential natural gas need for heating was reduced 15.9%.[1]

The City of Chula Vista has adopted Green Building Standards (CVMC Chapter 15.12) and Energy Efficiency standards (CVMC Section 15.26.030) that requires increased energy efficiency 15% beyond 2008 Title 24 Part 6 Energy Code levels. For residential uses, this requirement represents a .75-1.35% reduction in electricity use and an 11.85%-12.45% reduction in natural gas usage. For commercial uses, this represents a 4.35% reduction in electricity use and a 9.9% reduction in natural gas usage.[2]

[1] *Quantifying Greenhouse Gas Mitigation Measures*; California Air Pollution Control Officers Association (CAPCOA), August 2010, Tables D-1 and D-2

[2] *Quantifying Greenhouse Gas Mitigation Measures*; California Air Pollution Control Officers Association (CAPCOA), August 2010, Tables BE-1.1 and BE-1.2

Water-related energy use consumes 19 percent of California's electricity, 30 percent of its natural gas, and 88 billion gallons of diesel fuel every year. The water-related energy use includes water and wastewater treatment as well as the energy needed to transport the water from it source (either northern California or the Colorado River). California Green Building Code Title 24, Part 11 (CALGreen) requires that indoor water use be reduced a minimum of 20%. The City has also reduced the demand for outdoor water use through the adoption of the Landscape Water Conservation requirements (CVMC 20.12).

CALGreen also requires that a minimum of 50% all new construction waste generated at the site be diverted to recycle or salvage. Additionally, the state has set per capita disposal rates of 5.3 pounds per person per day for the City of Chula Vista. The City requires new construction to divert 90% of the inert waste and not less than 50% of the remaining waste generated during construction (CVMC 8.25.095).

*Summary of Carbon Dioxide ($CO_2$), Reductions*

$CO_2$ is produced by both natural and anthropogenic (human) sources. $CO_2$ will be emitted by Village 9 permitted uses through the combustion of fossil fuels in vehicles, from electricity generation and natural gas consumption, and from solid waste disposal. As directed by Assembly Bill (AB) 32, the Climate Change Scoping Plan (December 2008 prepared by CARB) includes measures to reduce statewide $CO_2$ to 1990 levels by 2020 from forecasted business-as-usual (BAU) 2020 emissions. The majority of the reduction strategies are to come from the two sectors that generate the most $CO_2$ emissions statewide: transportation and electricity generation. The majority of the reduction in transportation-related and energy-related $CO_2$ emissions are to be achieved through statewide regulatory mandates affecting vehicle emissions and types of fuel the vehicles use, public transit, and public utilities. The remaining reductions are to be achieved through direct regulation and price incentive measures affecting oil and gas extraction industries and forestry practices (including increased tree planting programs).

To address emissions from vehicles, CARB is proposing a comprehensive three-prong strategy: reduce GHG emissions from vehicles, reduce the carbon content of the fuel these vehicles burn, and reduce the miles these vehicles travel.

AB 1493 (Pavley) required CARB to develop and adopt regulations to reduce GHG emissions from passenger motor vehicles, beginning with the 2009 model year. The Pavley regulations establish specific GHG emissions levels for both passenger cars and light-duty trucks. The standards become more stringent each year through 2016. The GHG emission reductions to be achieved by the Pavley regulations are substantial. It is expected that the Pavley regulations will reduce GHG emissions from California passenger cars by 22% in 2012 and 30% in 2016 (www.arb.ca.gov/cc/ccms/ccms.htm).

CARB has also adopted a Low Carbon Fuel Standard (LCFS) that sets carbon reduction standards for the types of fuels that can be sold in California, particularly renewable fuels. This will reduce the GHG emissions even if total fuel consumption is not reduced.

Finally, CARB is to set regional targets for reducing passenger vehicle emissions. SB 375 requires Metropolitan Planning Organizations (MPOs) in California to update their Regional Transportation Plans to adopt a Sustainable Communities Strategy (SCS) that prescribes land use allocations that promote smart growth development. SANDAG is the San Diego region's MPO. According to the San Diego SCS plan, the CARB target of a 7 percent per capita reduction in 2020 and a 15 percent per capita reduction by 2035 would be met with the SCS implementation.

The three most applicable measures to land use planning and development within the City of Chula Vista's control include the regional transportation-related GHG targets, support for the Million Solar Roofs program, and energy efficiency measures. Since the early 1990s, the City has been engaged in multiple climate change forums including the United Nations Framework Convention on Climate Change (UNFCCC), the Cities for Climate Protection campaign, and the U.S. Conference of Mayor's Climate Protection Agreement. The key plans and ordinances that the City has adopted and implemented to achieve citywide GHG emissions reductions are summarized below.

Each participant in the International Council of Environmental Initiatives (ICLEI) was to create local policy measures to ensure multiple benefits in the City and, at the same time, identify a carbon reduction goal through the implementation of those measures. In its $CO_2$ Reduction Plan developed in 1995 and officially adopted in 2000, Chula Vista committed to lowering its $CO_2$ emissions by diversifying its transportation system and using energy more efficiently in all sectors. To focus efforts in this direction, the City adopted the $CO_2$reduction goal of 20% below 1990 levels by 2010. In order to achieve this goal, seven actions were identified (see page 31), which when fully implemented, were anticipated to save 100,000 tons of $CO_2$each year.

The 2008 GHG Emissions Inventory has noted that compared to 1990, Chula Vista's citywide GHG emissions have increased by 29%, however, per capita and per housing unit levels are approximately 25% and 17% below 1990 levels, respectively. The Climate Change Working Group (CCWG) has helped develop recommendations to reduce the community's GHGs in order to meet the City's 2010 GHG emissions reduction targets.

The CCWG ultimately chose seven measures that were adopted by the City Council and the horizon date was delayed until 2012 instead of 2010. The measures that relate to new development include the following:

- A minimum energy efficiency of 15% above the 2005 Title 24, and
- Implementation of smart growth principles.

## 4. PROJECT DESCRIPTION

Otay Ranch is a 23,000-acre master-planned community and includes a mix of land uses within 20 villages and/or planning areas. Village 9 is located at the southerly edge of the Otay Valley Parcel of Otay Ranch just east of State Route (SR-125) near the intersection of Eastlake Parkway and Hunte Parkway. Key aspects that influenced the design of Village 9 relative to pedestrian, transit, and automobile circulation, and urban design, include the future University and Regional Technology Park (RTP) located to the east and the EUC planned to the north. The heart of the Village is the Town Center. It is envisioned that this core area provide for the needs of the community by featuring a blend of shopping, restaurant, civic, institutional, educational, recreational, entertainment, personal service, and residential opportunities. The Town Center will provide a viable and intensified mixture of uses that will draw university students and faculty, residents, business owners, RTP employees, and visitors. Intensified residential densities and commercial uses at the heart of the community enhance and support transit use, promote walkability, and create vibrant commercial and public spaces that promote social interaction and create a strong community identity.

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The overall plan is organized such that development intensity decreases from the EUC and Main Street, south toward the Town Center, and finally south toward Otay Valley Road and Otay River Valley. Village 9 includes community commercial uses and multi-family opportunities for affordable and new generational housing in the intensified Town Center, the opportunity for additional high density affordable housing and neighborhood commercial uses south and east of the Town Center, and attached and detached single family housing south of Otay Valley Road. This broad spectrum of housing and commercial opportunities is intended to meet the anticipated demands of students, faculty, and professionals associated with the adjacent University and RTP as well as the general population.

Figure 4: SPA Site Utilization Plan and Figure 5: SPA Site Utilization Summary implement the land uses contemplated by the General Plan and the Otay Ranch General Development Plan. The site utilization plan and site utilization summary work together and assign a general utilization to each transect within the SPA. In addition to defining each transect's utilization, individual planning areas are also assigned a targeted number of dwelling units and commercial square feet. The range of units and commercial square feet shown in Figure 5 are only estimates. Units and commercial uses may be transferred between planning areas provided that uses being transferred are consistent with the site utilization of the receiving planning area, that the overall

density of each transect remains consistent with the density ranges (du/ac) specified for each transect, and that the transfer meets all of the requirements specified in §9.3.2 of the SPA.

The Village 9 SPA Plan strives to create a new mixed-use community centered around a university-oriented Town Center. This Town Center is organized to create a series of focal points that emulate a traditional "downtown," within a system of "blocks" or planning areas. Block sizes have been carefully defined to maximize walkability and promote a vibrant and active town center area. Uses are envisioned to include retail, residential, and services that support student and faculty life. Such uses might include restaurants, coffee shops, bookstores, and opportunities for shopping and entertainment. These interchangeable mixed-use components are centered on Campus Boulevard and an urban couplet located between a Neighborhood Park and the future proposed University.

A key aspect of the plan is synergy and adaptability with the future University. This synergy is emphasized through Campus Boulevard, an east-west street and urban plaza that serves as a transitional space for the community. The design of the street makes this space suitable for community events such as art fairs, farmer's markets, and festivals. Additional east-west grid streets run parallel to Campus Boulevard and are envisioned to penetrate as walking and visual corridors into the planned University, creating a strong pedestrian linkage and adjacency.


***Figure 4: SPA Site Utilization Plan***

## Commercial and Residential Land Use

| Planning Area | Gross Acres | Transect[1] | Target D.U.[2] | Target Range C'ml Sq.Ft. (K)[2][6] |
|---|---|---|---|---|
| **Eastern Urban Center (EUC) - 28- 60 du/ac** | | | | |
| A | 9.5 | T-5: UC | 380 | 78-235 |
| B-1 | 4.6 | T-5: UC | 183 | 38-115 |
| B-2 | 3.9 | T-5: UC | 136 | 34-101 |
| D | 11.2 | T-5: UC | 448 | 94-278 |
| E-1 | 4.6 | T-5: UC | 183 | 40-115 |
| E-2 | 4.2 | T-5: UC | 168 | 34-101 |
| H-1 | 4.7 | T-5: UC | 188 | 38-115 |
| H-2 | 5.6 | T-5: UC | 226 | 44-130 |
| **Subtotal** | **48.3** | | **1,912** | **400-1,190** |
| **Town Center (TC) - 18-45 du/ac** | | | | |
| **Planning Area** | **Gross Acres** | **Transect[1]** | **Target D.U.[2]** | **Target Range C'ml Sq.Ft. (K)[2][7]** |
| K-1 | 3.7 | T-4: TC | 148 | 0 |
| K-2 | 3.8 | T-4: TC | 152 | 0 |
| M | 3.6 | T-4: TC | 80 | 10-29 |
| N | 3.5 | T-4: TC | 57 | 20-52 |
| O-1 | 3.6 | T-4: TC | 80 | 10-29 |
| O-2 | 3.6 | T-4: TC | 80 | 10-29 |
| P | 3.6 | T-4: TC | 80 | 10-29 |
| Q | 3.5 | T-4: TC | 57 | 20-52 |
| R-1 | 3.6 | T-4: TC | 80 | 10-29 |
| R-2 | 3.6 | T-4: TC | 80 | 10-29 |
| **Subtotal** | **36.1** | | **894** | **100-278** |
| **Mixed Use (MU) - 10-45 du/ac** | | | | |
| **Planning Area** | **Gross Acres** | **Transect[1]** | **Target D.U.[2]** | **Target Range C'ml Sq.Ft. (K)[2]** |
| F | 8.2 | T-4: UN | 136 | 0 |
| G[2] | -- | T-4: UN | 0 | 0 |
| **Subtotal** | **8.2** | | **136** | **0** |
| **Mixed Use (MU) - 10-27 du/ac** | | | | |
| **Planning Area** | **Gross Acres** | **Transect [1]** | **Target D.U.[2]** | **Target Range C'ml Sq.Ft. (K)[2][8]** |
| S-1 | 6.3 | T-3: NC | 104 | 0 |
| S-2 | 3.5 | T-3: NC | 58 | 0 |
| T | 3.4 | T-3: NC | 34 | 0-32 |
| U-1 | 3.5 | T-3: NC | 58 | 0 |
| U-2 | 3.5 | T-3: NC | 58 | 0 |
| V | 8.6 | TT-3: NC | 142 | 0 |
| W[2] | -- | T-3: NC | 0 | 0 |
| Y-1 | 3.3 | T-3: NC | 54 | 0 |
| Y-2 | 3.0 | T-3: NC | 50 | 0 |
| Z-1 | 3.7 | T-3: NC | 61 | 0 |
| Z-2 | 2.7 | T-3: NC | 45 | 0 |
| CC | 7.7 | T-3: NC | 128 | 0 |
| **Subtotal** | **49.2** | | **792** | **0-32** |
| **Medium Density Residential (M) - 6-11 du.ac** | | | | |
| **Planning Area** | **Gross Acres** | **Transect [1]** | **Target D.U.[2]** | |
| AA | 6.8 | T-2: NG | 72 | |
| BB | 8.4 | T-2: NG | 89 | |
| **Subtotal** | **15.2** | | **161** | |
| **Low Medium Density Residential Village (LMV) - 3-6 du.ac** | | | | |
| **Planning Area** | **Gross Acres** | **Transect [1]** | **Target D.U.[2]** | |
| DD | 12.2 | T-2: NE | 47 | |
| EE | 7.1 | T-2: NE | 26 | |
| FF | 8.8 | T-2: NE | 32 | |
| **Subtotal** | **28.1** | | **105** | |
| **TOTAL** | **185.1 Acres** | | **4,000** | **500K - 1,500 K[3]** |

## Public, Quasi Public, and Other Uses

| Planning Area | Land Use | Gross Acres | Transect [1] | Description |
|---|---|---|---|---|
| **Community Purpose Facility (CPF)[3]** | | | | |
| J | TC | 2.3 | SD: CPF | CPF |
| X | MU | 2.7 | SD: CPF | CPF |
| **Subtotal** | | **5.0** | | |
| **Potential School (S) Sites[4]** | | | | |
| **Planning Area** | **Land Use** | **Gross Acres** | **Transect [1]** | **Description** |
| G | MU | 7.9 | T-4: UN | Elementary |
| W | MU | 11.9 | T-3: NC | Elementary |
| **Subtotal** | | **19.8** | | |
| **Parks (P)** | | | | |
| **Planning Area** | **Land Use** | **Gross Acres** | **Transect [1]** | **Description** |
| C | P | 3.6 | SD: P | Town Square |
| I | TC | 1.5 | SD: P | Town Square |
| L | P | 14.8 | SD: P | Neighborhood |
| GG | P | 2.9 | SD: P | Pedestrian |
| HH | P | 1.3 | SD: P | Pedestrian |
| II | P | 3.4 | SD: P | Pedestrian |
| **Subtotal** | | **27.5** | | |
| **Open Space (OS)** | | | | |
| **Planning Area** | **Land Use** | **Gross Acres** | **Transect [1]** | **Description** |
| OS-1 | OS | 2.8 | T-1: OS | Open Space |
| OS-2 | CVOSP[5] | 3.3 | T-1: OP | Preserve |
| OS-3 | OS | 2.8 | T-1: OS | Open Space |
| OS-4 | CVOSP[5] | 0.7 | T-1: OP | Preserve |
| **Subtotal** | | **9.6** | | |
| **Other** | | | | |
| **Planning Area** | **Land Use** | **Gross Acres** | **Transect [1]** | **Description** |
| JJ | U | 50.0 | SD: U | University/RTP |
| Arterials | | 17.9 | | Right-of-Way |
| SR-125 | | 8.2 | | Right-of-Way |
| **Subtotal** | | **76.1** | | |
| **TOTAL** | | **138.0 Acres** | | |

Notes:

(1) Transects are defined in Chapter 3.

(2) See Chapter 9 regarding Intensity Transfers and minimum retail/commercial square footage requirement.

(3) As defined by CVMC Chapter 19.48.

(4) School sites will revert to mixed use if sites are not accepted by the school district.

(5) Chula Vista Open Space Preserve.

(6) 390,000 square feet of office and 10,000 square feet of retail for the low range; 1, 140,000 square feet of office and 50,000 square feet of retail for the high range; excludes live/work.

(7) 10,000 square feet of office and 90,000 square feet of retail for the low range; 10,000 square feet of office and 268,000 square feet of retail for the high range; excludes live/work.

(8) 32,000 square feet of retail for the high range.

**SPA Total Area: 323.1 Gross Acres**

***Figure 5: SPA Site Utilization Summary***

The strong urban form in the Town Center, Urban Center, and Urban Neighborhoods requires the following:

- Buildings to be oriented toward public streets, parks, and pedestrian spaces;
- Continuous facades that are placed near or at the back of sidewalk; and
- Uses that support pedestrian activity such as dining, retail, entertainment, patios, plazas, and public art.

The Urban Center serves as a transition from the Town Center to the EUC to the north. The Urban Center will include high to mid-rise buildings with a mix of uses including retail, hospitality, office, and multifamily residential opportunities that support the Regional Technology Park and the EUC. The Town Center provides mix-use development that supports adjacent residential neighborhoods and fosters walkability. Uses within the Town Center include a mix of retail sales and services with high density attached homes. The Urban Neighborhoods will be a residential extension of the Town Center. While commercial uses are permitted in the Urban Neighborhoods, this Transect is envisioned to be predominately residential in character, with the retail focus remaining in the Town Center Transect. Residential neighborhoods south of Otay Valley Road provide an alternative living environment that is more single family in nature with large private yards and building setbacks. This environment provides a quiet, less urban lifestyle while establishing an appropriate relationship to the natural habitat in the adjacent Preserve area.

Class II bicycle facilities are planned along all circulation element roadways through Village 9 except Street B. Sidewalks will be provided throughout Village 9. Except for Main Street, Otay Valley Road, and Street B, all roadways internal to the Village are designed to local street standards with speed limits of 25 to 35 mph. Slow traffic speeds are conducive to both walking and bicycling and provide the necessary linkage to the regional bicycle circulation network.

Sidewalks will be provided through Village 9 along with bulb-outs at key locations to reduce pedestrian crossing distances. In addition, the land uses designated in the Urban and Town Centers are intended to be pedestrian and bicycle friendly. With design travel speeds of 35 mph along Street “A” through the couplet, the roadways are designed to provide a comfortable walking environment. On-street parking will be provided on many of the internal streets to help reduce traffic speeds and buffer the pedestrian from traffic flow.

A pedestrian and bicyclist bridge will be constructed over SR-125 that will improve the pedestrian and bicycle linkages between Village 8 East and Village 9. The bridge is located approximately midway between Otay Valley Road and Main Street and will connect in Village 9 at the proposed community park located along the western boundary of the Village. This bridge is intended to reduce the reliance on passenger vehicle trips and encourage walking and bicycling between the two communities and throughout the ranch.

Village 9 is transit ready. In conformance with General Plan policy, public transportation is an integral part of Otay Ranch. The Village 9 plan provides for potential transit services with options available depending on what future transit service program is implemented. A public transit line and stops are integrated into the plan and are located within or in close proximity to the highest intensity neighborhoods and the future University campus uses.

The current regional transit plan includes transit lines on East "H" Street, East Palomar Street, La Media Road, and Eastlake Parkway. Transit stops are planned to be located approximately five to six miles apart with the Village 9 stop planned near the intersection of Campus Boulevard and Street B. In conformance with the General Plan, a future transit line also is planned on Main Street. The actual transit plan will be developed in conjunction with the San Diego Association of Governments (SANDAG). Specific access points as well as the internal circulation for bicycle riders and pedestrians and exact roadway configurations will be approved during the Tentative Tract Map (TM) process.

An additional means to reduce GHG emissions is the use of LSVs. LSVs are envisioned as alternative modes of travel within and between the Otay Ranch villages. In Village 9, LSVs may travel on all village streets with a maximum travel speed of 35 mph. Except for Main Street and Otay Valley Road, all village streets are planned for maximum travel speeds of 25 to 35 mph.

Vehicle trip generation is based on the project traffic study, which was prepared by RBF Consulting (2013). The projected Average Daily Trips (ADT) rate for the Village 9 is 34,067 trips. The projected ADT accounts for internal capture from mixed-use development and the reduction in vehicle trips compared to similar developments that do not provide access to transit. Potential bust stops are proposed in Village 9 in the Town Center and along Otay Valley Road. The projected ADT also takes into account the Transportation Demand Management (TDM) program included in the Village 9 SPA Plan. The TDM includes strategies to reduce vehicle trips and miles traveled and to design a multi-modal transportation system, and establishes a Transportation Management Association to provide transportation services in a particular area to reduce vehicle miles and implement other TDM strategies.

According to the Otay Ranch Village 9 Air Quality Technical Report dated May 2013 prepared by Atkins, the project trip generation rates account for the approximately 40 percent reduction in vehicle trips that would occur as a result of the mixed-use areas, transit use, and availability of pedestrian and bicycle facilities proposed as part of the SPA plan. In addition, future vehicular emissions may be lower than estimated due to increasingly stringent California fuel efficiency requirements. As determined by SANDAG as part of the GPA/GDPA EIR process, the average daily trip length for the Village 9 will be 5.08 miles (less than the regional average trip length of 5.8 miles).

The Village 9 SPA Plan incorporates several additional features into the site design that promote alternative transportation use, reduce traffic congestion, encourage energy efficiency, and reduce area source pollutants. These measures include the following:

1. Provide shower and locker facilities at offices with more than ten occupants to encourage bicycle use.
2. Design parking lots to promote use of mass transit and car pools.
3. Synchronize the traffic lights included as part of an individual development project with previously installed traffic lights in order to reduce traffic congestion.

4. Utilize solar heating technology as practical. Generally, solar panels can be cost-effectively used to heat water for domestic use and for swimming pools. Advances in solar technology in the future may make other applications appropriate.
5. Enhance energy efficiency in building designs and landscaping plans.
6. Identify an environmental coordinator to be responsible for education and disseminating information on ridesharing and/or mass transit opportunities, recycling, energy conservation programs, etc.
7. Install only electric or natural gas fireplaces in new development. No wood burning fireplaces are permitted.
8. When siting sensitive land uses such as residences, schools, day care centers, playgrounds and medical facilities the recommendations set forth in Table 1-1 of California Air Resources Board's (CARB) Land Use and Air Quality Handbook (CARB 2004) will be use as a guideline. Specifically, new sensitive uses would not be located within 50 feet of any typical-sized gas station (one that has a throughput of less than 3.6 million gallons per year). No gas stations with a throughput of 3.6 million gallons per year or greater shall be developed within Village 9.

## 5. EFFECT OF PROJECT ON LOCAL/REGIONAL AIR QUALITY

This section includes a generalized discussion of Village 9's short-term and long-term effects on local and regional air quality including its contribution to global climate change.

Utilizing all the federal, state, and local strategies for reducing GHGs, Village 9 is projected to reduce GHG emissions a total of 34% from business-as-usual (BAU) through the incorporation of smart growth vehicle circulation patterns, lower-emitting vehicles, and the advanced energy efficiency and water conservation design requirements that reduce GHG emissions. The advanced energy efficiency and water conservation design requirements include both the California Title 24 requirements for energy as well as the CALGreen requirements which are then furthered through the City of Chula Vista's green building and energy requirements.

*Construction Related Emissions*

Air pollutant emission sources during project construction include exhaust and particulate emissions generated from construction equipment; fugitive dust from site preparation, grading, and excavation activities; and volatile compounds that evaporate during site paving and painting of structures. Village 9 is approximately 273 acres; however, only 263.5 acres of the site would be disturbed during construction. The remaining area consists of areas designated for open space. A total of 6.7 acres would be disturbed off-site for the construction of the sewer and storm drain corridor and access road (1.1 acres) and grading required due to topography, fuel modification, and drainage requirements (5.6 acres). The total disturbance area would be 270.2 acres.

The following construction-related mitigation measures will be implemented in Village 9:

*GDP EIR-1*

***5.4-1 Short-term Air Quality Violations Reduction Measures.***

The following techniques to reduce construction emissions shall be implemented during all construction activities:

1. Minimize simultaneous operation of multiple construction equipment units (i.e., phase construction to minimize impacts).
2. Use low pollutant-emitting construction equipment.
3. Use electrical construction equipment as practical.
4. Use catalytic reduction for gasoline-powered equipment.
5. Use injection-timing retard for diesel-powered equipment.
6. Water the construction area twice daily to minimize fugitive dust.
7. Stabilize (for example hydroseed) graded areas as quickly as possible to minimize fugitive dust.
8. Pave permanent roads as quickly as possible to minimize dust.

*GPA/GDPA SEIR 5.11-1*

5.4-2 **Dust Control Measures.**

Mitigation of $PM_{10}$ impacts requires active dust control during construction. As a matter of standard practice, the City shall require the following standard construction measures be included on all grading plans to the satisfaction of the City Engineer, and shall be implemented during construction to the extent applicable:

1. All unpaved construction areas shall be sprinkled with water or other acceptable San Diego APCD dust control agents twice daily during dust-generating activities to reduce dust emissions. Additional watering or acceptable APCD dust control agents shall be applied during dry weather or on windy days until dust emissions are not visible.
2. Trucks hauling dirt and debris shall be properly covered to reduce windblown dust and spills.
3. A 20-mile-per-hour speed limit on unpaved surfaces shall be enforced.
4. On dry days, dirt and debris spilled onto paved surfaces shall be swept up immediately to reduce re-suspension of particulate matter caused by vehicle movement. Approach routes to construction sites shall be cleaned daily of construction-related dirt in dry weather.
5. On-site stockpiles of excavated material shall be covered or watered.
6. Disturbed areas shall be hydroseeded, landscaped, or developed as quickly as possible and as directed by the City and/or APCD to reduce dust generation.
7. To the maximum extent feasible:
   i. Heavy-duty construction equipment with modified combustion/fuel injection systems for emissions control shall be utilized during grading and construction activities.
   ii. Catalytic reduction for gasoline-powered equipment shall be used.
8. Equip construction equipment with pre-chamber diesel engines (or equivalent) together with proper maintenance and operation to reduce emissions of NOx, to the extent available and feasible.

9. Electrical construction equipment shall be used to the extent feasible.
10. The simultaneous operations of multiple construction equipment units shall be minimized (i.e., phase construction to minimize impacts).

*V9 Air-1 Construction Best Management Practices*

During all construction activities for the proposed project, the project applicant shall ensure implementation of the following BMPs to reduce the emissions of $NO_x$ and fugitive dust (PM10 to PM2.5). Prior to issuance of a grading permit, the City Engineer shall verify that these practices are specified on the grading plan.

1. All construction equipment shall use aqueous diesel fuel and be outfitted with best available control technology devices certified by CARB. A copy of each unit's best available control technology documentation shall be provided at the time of mobilization of each applicable unit of equipment.
2. Approach routes to the site shall be cleaned daily of construction-related dirt.
3. Apply chemical stabilizer or pave the last 100 feet of internal travel path within the construction site prior to public road entry.
4. Install wheel washers or rumble plates adjacent to a paved apron prior to any vehicle entry on public roads.
5. Remove any visible track-out into traveled public streets within 30 minutes of occurrence.
6. Wet wash the construction access point at the end of each workday if any vehicle travel on unpaved surfaces has occurred.
7. Provide sufficient perimeter erosion control to prevent washout of silty material onto public roads.
8. General contractors shall maintain and operate construction equipment so as to minimize exhaust emissions. During construction, trucks and vehicles in loading and unloading queues should turn their engines off when not in use to reduce vehicle emissions. Construction emissions should be phased and scheduled to avoid emissions peaks and shall be discontinued during second stage smog alerts.
9. During construction, site grading activities within 500 feet of a school in operation shall be discontinued or all exposed surfaces shall be watered to minimize dust transport off-site to the maximum degree feasible, when the wind velocity is greater than 15 miles per hour in the direction of the school.

Project related construction emissions are shown in Figure 6. Project related emissions would be below the significant thresholds during underground utility construction, building construction, and coating activities. Grading activities would exceed the significant threshold for Nitrous Oxides ($NO_x$), Particulate Matter ($PM_{10}$, and $PM_{2.5}$), and surface improvements (paving) would exceed the $NO_x$ thresholds, resulting in potentially significant impacts. Actual emissions may be less than calculated by the URBEMIS model (a software model designed to estimate air emissions from land use development projects) since this model does not take into account additional standards adopted by California Air Resources Board (CARB) after 2007 and assumed a worst-case scenario. Mitigation measures implemented during grading activities would reduce $NO_x$, $PM_{10}$, and $PM_{2.5}$ emissions but not to a less than significant level, resulting in significant and unavoidable impacts, as shown in Figure 6.

## *Figure 6: Mitigated Construction Maximum Daily Emissions by Activity (pounds/day) (Atkins May 2013)*

| Construction Activity | Pollutant Emissions (pounds/day) | | | | | |
|---|---|---|---|---|---|---|
| | CO | VOC | NOx | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| **Unmitigated Emissions** | | | | | | |
| Mass Grading[1] | 162 | 41 | **353** | 0 | **4,344** | **917** |
| Trenching[2] | 16 | 5 | 41 | 0 | 2 | 1 |
| Surface Improvements (paving)[3] | 52 | 15 | **121** | 0 | 5 | 4 |
| Building Construction and Coating Phases[4] | 192 | 37 | 96 | 0 | 5 | 4 |
| **Combined Daily Total for all Construction Activities (unmitigated)** | 422 | **98** | **611** | 0 | **4,356** | **926** |
| **Mitigated Emissions[5]** | | | | | | |
| Mass Grading[1] | 162 | 41 | **300** | 0 | **2,453** | **515** |
| Trenching[2] | 18 | 5 | 35 | 0 | 1 | 1 |
| Surface Improvements (paving)[3] | 52 | 15 | **103** | 0 | 1 | 1 |
| Building Construction and Coating Phases[4] | 192 | 37 | 87 | 0 | 5 | 4 |
| **Combined Daily Total for all Construction Activities (mitigated)** | 424 | **98** | **525** | 0 | **2,460** | **521** |
| Significance Threshold | 550 | 75 | 100 | 150 | 150 | 55 |
| Significant Impact? | No | **Yes** | **Yes** | No | **Yes** | **Yes** |

**Bold** = Exceeds significance threshold
CO = carbon monoxide; VOC = reactive organic gases; $NO_x$ = nitrogen oxides;
$SO_x$ = sulfur oxides; $PM_{10}$ = respirable particulate matter; $PM_{2.5}$ = fine particulate matter
Modeling assumptions: Emissions are based on assumptions for the Purple development phase. Worst-case construction activities for the Purple development phase were assumed to occur during 2013-2015. No blasting for construction would be required.

[1] Assumes a three-month period and a maximum land disturbance of 20 acres per day. A total of approximately 274.3 acres would be disturbed over four development phases. A total of 6.7 million cubic yards would be graded and replaced within the disturbance area, or 1.68 million cubic yards in each phase. All cut material would be used on site and no hauling of material off site would be required. Equipment list for grading includes an excavator, two graders, four heavy duty trucks, five dozers, 12 scrapers, and two water trucks.

[2] Assumes a two-month period. Equipment list includes two excavators, two dump trucks, a dozer, two backhoes, and a water truck.

[3] Assumes a two-month period. Paving and surface improvements would be required for approximately 12 percent of the SPA area (32 acres), or eight acres per phase. Assumes an additional 1.1 acres for off-site improvements. Equipment list includes a grader, a paver, a roller, and 27 dump trucks and concrete trucks.

[4] Assumes a two-year period and architectural coating activities would occur simultaneously with the building construction activities. Assumes building construction would require a total of 11 dump trucks and concrete trucks, an excavator, a backhoe, and a water truck. Calculations are based on the Purple phase, which includes development of 1,573 multi-family units, a town square, and 754,000 square feet of commercial land use. Assumes the model defaults low VOC coating emissions (250 grams of VOC per liter or less).

[5] Assumes use of diesel particulate filters and diesel oxidation catalysts for all equipment. Due to a calculation error in the URBEMIS 2007 model, the total reduction in $PM_{10}$ and $PM_{2.5}$ emissions that would occur as result of watering exposed surfaces, applying chemical stabilizers, and replacing ground cover cannot be calculated because the URBEMIS 2007 model overestimates the reduction in emissions. SCAQMD recommends application of the single highest control measure. Watering twice daily was applied for the proposed project. Additionally, emission reductions estimates are not available for all of the BMPs. Emissions would likely be reduced compared to these estimates, but not to a less than significant level.

Source: URBEMIS 2007. See Appendix C1 for data sheets.

*Operational Related Emissions*

The major source of emissions related to the day-to-day operations of full build-out of the Village 8 are produced by project-generated vehicle trips, a shown in Figure 7. Secondary sources of emissions include burning natural gas for space and water heating, fireplaces, landscape maintenance equipment, consumer products, and periodic repainting of interior and exterior surfaces. These sources also emit significant volatile organic compounds (VOCs) There are no feasible mitigation measures available at the project level to reduce vehicular emissions other than reducing vehicle trips.

The Otay Ranch GDP Final Program EIR includes land use policies, siting/design policies, and transportation-related management actions to mitigate operational emissions (Ogden 1992). All applicable measures have already been incorporated into the SPA plan, such as provision of bike lanes, providing services near residences, and providing transit support facilities such as bus stops. There are no other feasible mitigation measures available at the project level to reduce vehicular emissions other than reducing vehicle trips.

The project trip generation rates account for the approximately 40 percent reduction in vehicle trips that would occur as a result of the mixed-use areas, transit use, and availability of pedestrian and bicycle facilities proposed as part of the SPA plan. In addition, future vehicular emissions may be lower than estimated due to increasingly stringent California fuel efficiency requirements. Some measures cannot be implemented at the SPA level, such as providing video-conference facilities in work places or requiring flexible work schedules. Additionally, there are no feasible mitigation measures currently available to reduce area sources of emissions without regulating the purchases of individual consumers. Operation emissions of VOCs, $NO_x$, and $PM_{10}$ would be significant and unavoidable as shown in Figure 7.

***Figure 7: Operational Emissions (Atkins May 2013)***

| Emissions Source | Pollutant Emissions (pounds/ day) | | | | | |
|---|---|---|---|---|---|---|
| | VOC | $NO_x$ | CO | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ |
| Vehicular Sources [1] | **59** | 43 | 537 | 2 | **285** | **56** |
| Area Sources | | | | | | |
| Natural Gas[2] | 4 | 54 | 31 | 0 | 0 | 0 |
| Hearth[3] | 0 | 3 | 1 | 0 | 0 | 0 |
| Landscape | 3 | 0 | 23 | 0 | 0 | 0 |
| Consumer Products | **205** | 0 | 0 | 0 | 0 | 0 |
| Architectural Coatings[4] | 20 | 0 | 0 | 0 | 0 | 0 |
| **Total Emissions** | **291** | **100** | **592** | **2** | **285** | **56** |
| **Significance Thresholds** | 55 | 55 | 550 | 150 | 150 | 55 |
| Significant Impact? | **Yes** | **Yes** | **Yes** | No | **Yes** | **Yes** |

**Bold** = exceeds significance threshold
CO = carbon monoxide; $NO_x$ = nitrogen oxides; VOC = volatile organic compounds; $SO_x$ = sulfur oxides
$PM_{10}$ = respirable particulate matter; $PM_{2.5}$ = fine particulate matter
Source: URBEMIS 2007. See Appendix A for data sheets.
Modeling assumptions: Calculations assume the full development of project at buildout (2030). Output is for summer emissions, with the exception of hearth emissions, where winter emissions were added to the daily emissions for a worst-case condition. Other assumptions include:

(1) Based on an ADT of 34,067 trips and an estimated vehicle trip length of 5.08 miles, which accounts for internal capture from mixed-use development, the reduction in vehicle trips compared to similar developments that do not provide access to transit, and the TDM program in the SPA Plan. A four percent vehicular emission reduction for VOC, NOx, CO, and $PM_{10}$ emissions was applied for traffic light synchronization based on the SCAQMD CEQA Air Quality Handbook (1993).

(2) Assumes buildings comply with 15% above 2005 Title 24 standards.

(3) Assumes 15 percent of homes would have fireplaces, consistent with assumptions of the GPA/GDPA. No wood burning fireplaces would be allowed.

(4) Includes the use of model defaults for low VOC coatings emissions (250 grams of VOC per liter or less).

In conclusion, there are construction and operation air quality impacts anticipated during either the construction or operation phases of the project after all mitigation measures have been utilized. Village 9 will be consistent with the City's General Plan, as amended. However, the growth projections for the Regional Air Quality Strategy (RAQS) were based on the 2005 General Plan. Even though the proposed project would be consistent with all the applicable transportation and area source control measures proposed in the RAQS to reduce emissions in the region, the project exceeds the growth projections in the RAQS and would exceed the significant thresholds for ozone precursors and particulate matter during construction and operation for the San Diego Air Basin.

## 6. QUANTITATIVE PROJECT DESIGN EVALUATION

Criterion Planners Inc. has performed a quantitative analysis for Village 9 using the INDEX PlanBuilder (INDEX) model developed specifically for the City. INDEX is an interactive GIS-based planning tool designed to evaluate proposed community/site designs against a set of performance standards. Village 9 has been compared against a set of "key indicators" that measure the performance characteristics of the project in relation to required minimum baseline scores. The key indicators, minimum scores, and compliance status are listed below in Figure 8 Chula Vista $CO_2$ INDEX Model for Village 9.

***Figure 8: Chula Vista $CO_2$ INDEX Model for Village 9 dated Sept 16, 2010 (from Criterion)***

| Element | Indicator | Definition | Threshold Score | Village 9 Score | Compliance Status (Y/N) |
|---|---|---|---|---|---|
| Land Use | Use Mix | Proportion of mixed or dissimilar developed land-uses among a grid of cells of user-defined size, expressed on a scale of 0-1. Includes vertical dissimilarity in mixed-use cells. | 0.11 | 0.58 | Yes |
| | Use Balance | Proportional balance of developed land-use, by land area, expressed on a scale of 0 (low) to 1 (high). | 0.59 | 0.86 | Yes |
| | Neighborhood Completeness | Percent of the following key uses present inside the SPA: 1)fire/police station, 2)library, 3)park, 4)school, and 5)general retail opportunities. | 60 | 60 | Yes |
| Housing | School Proximity to Housing | Average walk distance from all dwellings to closest designated school (measured in feet). | 3,248 | 956 | Yes |
| | Transit Proximity to Housing | Average walk distances from all dwellings to closest designated transit stop (measured in feet). | 2,857 | 2,278 | Yes |
| Employ-ment | Transit Proximity to Employment | Average walk distances from all businesses to closest designated transit stop (measured in feet). | 2.550 | 2,602 | No |
| Recre-ation | Park Proximity to Housing | Average walk distance from all dwellings to closest public or private park (measured in feet). | 1,699 | 1,536 | Yes |
| Travel | Internal Street Connectivity | Ratio of street intersections versus intersections and cul-de-sacs or dead-ending streets. | 0.70 | 0.73 | Yes |
| | Intersection Density | The number of street intersection per square mile including intersections between two or more local, collector, and/or arterial streets, and primary auto entrances to multi-family residential and non-residential parcels. Trails and cul-de-sac ends are not counted. | 130 | 57 | No |
| | Pedestrian Network Coverage | Percent of total street frontage with improved sidewalks on both sides. | 81.1 | 100 | Yes |
| | Residential Multi-Modal Access | Percent of dwellings within 1/8 mile of three or more travel modes (bike, car, transit, or walk). | 39.7 | 75.9 | Yes |
| | Daily Auto Driving (3Ds Methodology | Average daily vehicle miles traveled per capita. Threshold value is used as the baseline score; proposed SPA plan value calculated from 3D Methodology indicator elasticities. | 25.0 | 24.00 | Yes |
| Climate Change | Residential Building Energy Use | Annual MMBtu per capita from residential structural energy use. Units in MMBtu/year/capita. | 29.0 | 18.4 | Yes |
| | Non-residential Building Energy Use | Annual MMBtu per employee for retail, office, and general commercial building operations energy use. Units in MMBtu/year/employee. | 19.3 | 15.2 | Yes |
| | Residential Building $CO_2$ | $CO_2$ pollution emitted from residential buildings, including operations and embodied $CO_2$. Units in lbs/capita/year. | 4,778 | 3,008 | Yes |
| | Non-residential Building CO | $CO_2$ pollution emitted from retail, office, and general commercial buildings, including operations and embodies $CO_2$. Units in lbs/capita/year. | 3,139 | 2,480 | Yes |

*Compliance with Modeling Thresholds*

Village 9 is consistent with the City's adopted strategies for improving air quality and energy conservation, since its performance threshold scores for each key indicator shown on Figure 8 except for two areas: Transit proximity to employment and intersection density. These exceptions can be justified because of the unique circumstances described below.

Transit proximity is the measurement of the average walk distances from all businesses to the closest designated transit stop. The Chula Vista INDEX model included only Village 9 data and demonstrates the average walk distance from all businesses to the closest designated transit stop. Village 9 exceeds the threshold by only 52 feet. According to the Chula Vista General Plan, proposed transit stops are located approximately 0.5-1 mile apart, with one stop located in Village 9 and one stop located in the EUC to the north. Refer to Figure 9: General Plan Proposed Transit Routes and Stops. The businesses located in the northern area of Village 9, especially those businesses north of Main Street, are much closer to the transit stop located in the EUC. If the EUC transit stop was included in the INDEX model, the walk distance between businesses and transit stops would be more lower. In addition, four additional potential transit stops have been included in the SPA plan. Refer to Figure 10: SPA Transit Plan. If these factors were included in the INDEX modeling, Village 9 most likely would exceed the thresholds.

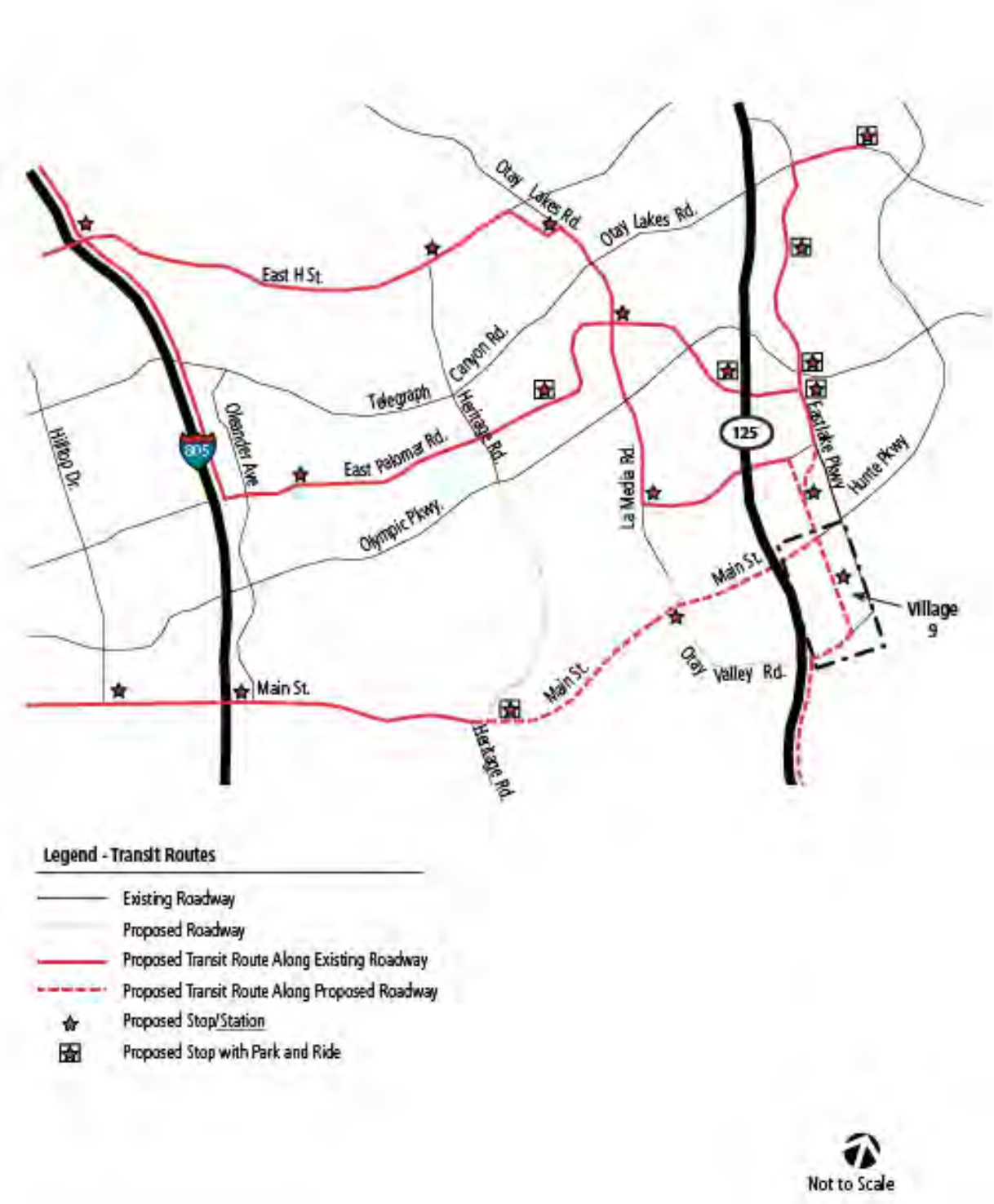


***Figure 9: Chula Vista General Plan Proposed Transit Routes and Transit Stops***


***Figure 10: SPA Transit Plan***

Intersection density measures the number of street intersection per square mile including intersections between two or more local, collector, and/or arterial streets, and primary auto entrances to multi-family residential and non-residential parcels. The INDEX model did not include intersections right at the boundary of the Village or just outside the boundary (indicated with a red square below). Due to the location of existing and planned intersections and physical barriers such as SR-125 and the MSCP, the number of potential intersections is limited. When all the primary auto entrances to multi-family residential and non-residential parcels are included, the intersection density exceeds 144 intersections per square mile. Refer to Figure 11: Intersection Density.

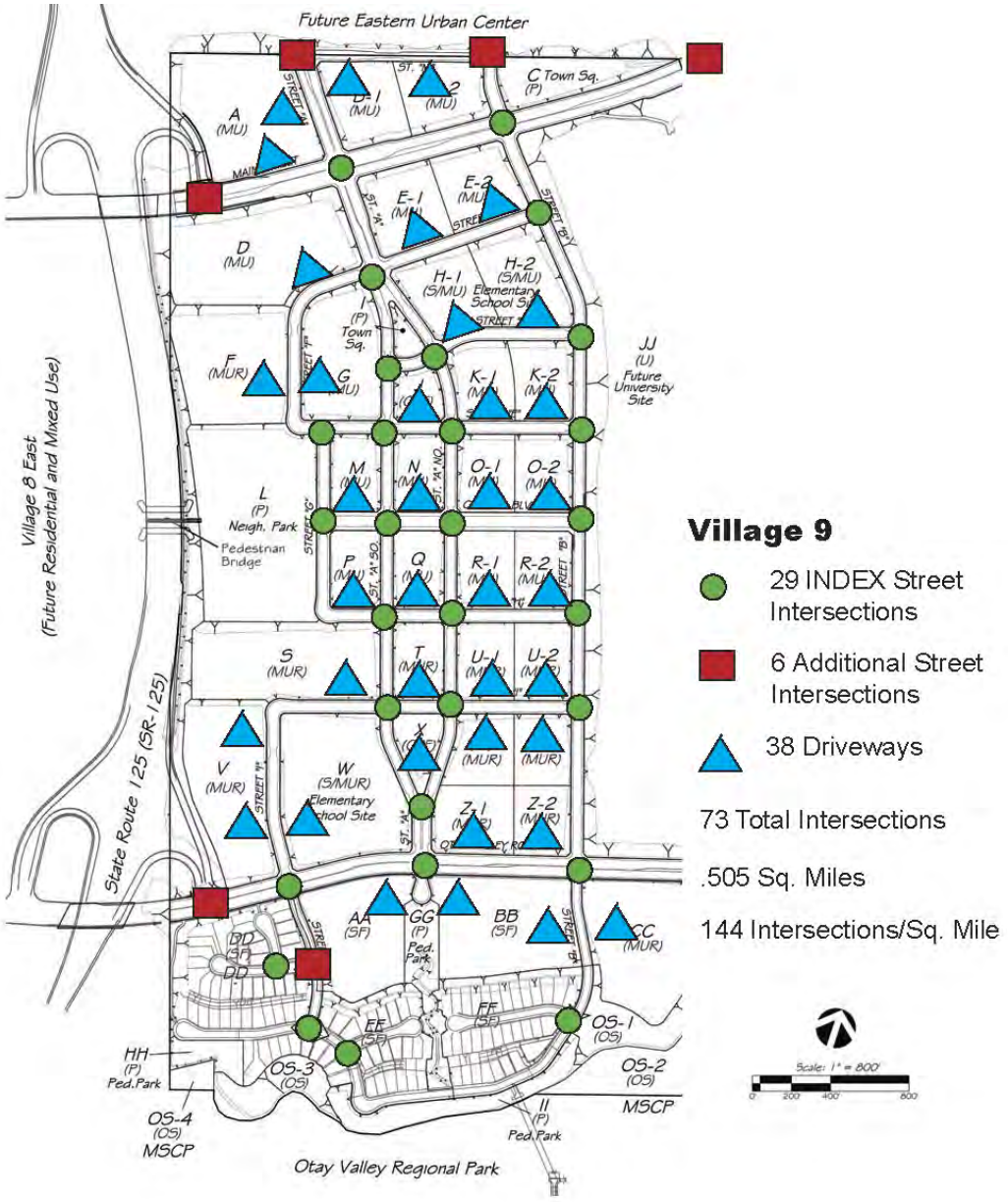


***Figure 11: Intersection Density***

# 7 COMMUNITY DESIGN AND SITE PLANNING FEATURES

This section describes the specific strategies that have been integrated in the project to create a sustainable community, including those project attributes designed to reduce air quality impacts by promoting walking and alternative travel modes, reducing vehicle miles traveled, and improving energy conservation.

Figure 12: Village 9 Community Design and Site Plan Features includes the list of specific measures that have been included in the Village 9 plan.

***Figure 12: Village 9 Community Design and Site Plan Features***

| | **Transportation Related Measures** |
|---|---|
| 1 | An integrated circulation system provides residents of the Urban Center (UC), Town Center (TC) and the adjacent neighborhoods non-automobile related circulation options that include walking, bicycling, LSV, and transit. |
| 2 | The mix of proposed residential, commercial, and community uses provide a complementary, mixed-use environment with a focus on promoting a walkable and bikeable community that promotes pedestrian activity. |
| 3 | Higher density uses will be provided along the Town Center couplet. The couplet provides improved safety for bicycle and pedestrian crossings, increased roadway capacity, less turn restrictions, reduced disruptions to traffic flow from curb parking/loading needs which leads to reduced GHG emissions from vehicles. |
| 4 | Direct pedestrian links extend from surrounding neighborhoods directly to the UC and TC. |
| 5 | Class II bicycle facilities are planned along all Transportation Element roadways. |
| 6 | Except for Main Street, Otay Valley Road, and B Street, all roadways internal to the Village are designed to local street standards with speed limits of 25 to 35 mph. Slow traffic speeds are conducive to walking and bicycling and provide the necessary linkage to the regional bicycle circulation network. |
| 7 | Land uses designated in the Town Center (adjacent to the couplet) are intended to be pedestrian and bicycle friendly. All roadways internal in the Town Center are designed to local street standards with speed limits of 25 to 35 mph. |
| 8 | The Urban and Town Centers provide the opportunity for employee services to be located within walking distance of employer-based businesses. |
| 9 | Live/work and shopkeeping opportunities are provided in the Town Center and the Urban Center |
| 10 | LSVs may travel on all village streets with a maximum travel speed of 35 miles per hour. |
| 11 | The current regional transit plan includes transit lines on East “H” Street, East Palomar Street, La Media Road, and Eastlake Parkway. Transit stops are planned to be located approximately five to six miles apart with the Village 9 station located near the intersection of Campus Boulevard and Street B. |
| 12 | A future transit line is planned on Main St. and there are potential transit stops at Street A and Main St. |
| 13 | The actual transit plan will be developed in conjunction with the San Diego Association of Governments (SANDAG). Specific access points as well as the internal circulation for bicycle riders and pedestrians and exact roadway configurations will be identified at that time. |
| 14 | Provide shower and locker facilities at offices with more than ten occupants to encourage bicycle use. |
| 15 | Design parking lots to promote use of mass transit and car pools. |
| 16 | Synchronize the traffic lights included as part of an individual development project with previously installed traffic lights in order to reduce traffic congestion. |
| 17 | Identify an environmental coordinator to be responsible for education and disseminating information |

| | |
|---|---|
| | on ridesharing and/or mass transit opportunities, recycling, energy conservation programs, etc. |
| | **Energy Conservation Related Measures** |
| 1 | Approximately 90% of the residential dwelling units will be small single family and multi-family residences that use less energy for heating and cooling when compared to larger single-family detached homes. |
| 2 | The Village 9 is oriented primarily on a north/south and east/west axis to take advantage of solar orientation. It has been demonstrated that passive solar design including the orientation of buildings can take advantage of the suns warmth in winter to assist with heating as well as minimize heat gain in summer months to assist with cooling. |
| 3 | California Green Building Code Title 24, Part 11 (CALGreen) requires that a minimum of 50% all new construction waste generated at the site be diverted to recycle or salvage. Additionally, the State has set per capita disposal rates of 5.3 pounds per person per day for the City of Chula Vista. Reducing waste could reduce the amount of vehicle trips transporting materials to and from the site. |
| 4 | CVMC 8.25.095 requires all new construction and demolition projects to divert 90% of inert waste (asphalt, concrete, bricks, tile, trees, stumps, rocks and associated vegetation and soils resulting from land clearing from landfill disposal); and 50% of all remaining waste generated. Contractors will be required to put up a performance deposit and prepare a Waste Management Report form to ensure that all materials are responsibly handled. Upon verification that the diversion goals have been met the performance deposit will be refunded. |
| 5 | Utilize solar heating technology as practical. Generally, solar panels can be cost-effectively used to heat water for domestic use and for swimming pools. Advances in solar technology in the future may make other applications appropriate. |
| 6 | Enhance energy efficiency in building designs and landscaping plans. |
| | **Other Measures to Improve Air Quality** |
| 1 | Install only electric or natural gas fireplaces in new development. No wood burning fireplaces are permitted. |
| 2 | When siting sensitive land uses such as residences, schools, day care centers, playgrounds and medical facilities the recommendations set forth in Table 1-1 of California Air Resources Board's (CARB) Land Use and Air Quality Handbook (CARB 2004) will be use as a guideline. Specifically, new sensitive uses would not be located within 50 feet of any typical-sized gas station (one that has a throughput of less than 3.6 million gallons per year). No gas stations with a throughput of 3.6 million gallons per year or greater shall be developed within Village 9. |

## 8. CHULA VISTA $CO_2$ REDUCTION PLAN

This section provides a comparative evaluation between the community /site design features and the energy efficiency emission reduction action measures contained in the City's Carbon Dioxide ($CO_{2)}$ Reduction Plan Appendix C.

The City of Chula Vista original $CO_2$ Reduction Plan adopted in November 2000 was intended to reduce greenhouse gas emissions by 20% below 1990 levels. The $CO_2$ Reduction Plan outlined steps for Chula Vista to reduce energy consumption, promote alternative transportation and design transit-friendly, walkable communities. The City staff conducted a GHG emissions inventory for 2005 to evaluate the City's progress in reaching its emissions goals. The 2005 inventory indicated that Chula Vista's annual citywide GHG levels had increased by 35% since 1990 due primarily to residential growth. During the same period, the City did make significant progress in reducing annual per capita emissions by 17% and avoiding nearly 200,00 tons of

GHG emissions annually. In addition, GHG emissions from municipal sources decreased by 18% mainly due to traffic signal energy-efficiency improvements. As a result of the 2005 Greenhouse Gas Emissions Inventory Report, in 2008, the City Council directed the re-evaluated of the program and convened a Climate Change Working Group (CCWG) to develop recommendations to reduce the community's greenhouse gas emissions or "carbon footprint" in order to meet the City's 2010 greenhouse gas emissions reduction targets. The CCWG (comprised of residential, business and community-group representatives) selected seven measures which the City Council adopted on July 10, 2008. These implementation measures include the following:

*1. Clean Vehicle Replacement Policy for City Fleet*
When City fleet vehicles are retired, they are replaced through the purchase or lease of alternative fuel or hybrid substitutes. In addition, the City fleet has begun installing new fuel tanks to allow heavy-duty vehicles to convert to biodiesel fuel immediately.

*2. Clean Vehicle Replacement Policy for City-Contracted Fleets*
As contracts for City-contracted fleet services (such as transit buses, trash haulers, and street sweeper trucks) are renewed, the City encourages contractors to replace their vehicles with alternative fuel or hybrid substitutes through the contract bid process.

*3. Business Energy Assessments*
Although not mandatory, businesses are encouraged to participate in a no cost energy assessment of their facilities to help identify opportunities for them to reduce monthly energy costs. The business assessment will be integrated into the existing business licensing process and codified through a new municipal ordinance.

*4. Green Building Standard*
This strategy stated that Chula Vista would implement a citywide, mandatory green building standard for new construction and major renovations. The new standard would have 3 main components: (1) a minimum energy efficiency (carbon equivalent) requirement of 15% above Title 24 - 2005, (2) the early adoption of the new California Green Building Codes for all residential and commercial projects and (3) a Carbon Offset Fee available for projects not meeting the 15% above Title 24 threshold. As identified in the following paragraphs, in November 2009, the City adopted a Green Building Standards ordinance (and in January 2010, an Increase Energy Efficiency Standards ordinance). Together these two ordinances implement the City's Green Building strategy identified in 2009.

*5. Solar & Energy Efficiency Conversion Program*
In accordance with this strategy, the City has created a community program to provide residents and businesses a streamlined, cost-effective opportunity to implement energy efficiency improvements and to install solar/renewable energy systems on their properties. To help stimulate the private-sector renewable market and lower the cost for installing renewable energy systems on new homes, the City will require all new residential buildings to include pre-wiring and pre-plumbing for solar photovoltaic and solar hot water systems, respectively.

*6. Smart Growth Around Trolley Stations*
The City has continued to implement "Smart Growth" design principles, which promote mixed-use and walkable and transit-friendly development, particularly in and around the E, H, and Palomar trolley stations. These principles were emphasized in the revised Chula Vista General Plan and the Urban Core Specific Plan. In addition, the City has initiated site planning, design studies and Specific Area Plan development to further support "Smart Growth" development that complements greenhouse gas reductions.

*7. Turf Lawn Conversion Program*
The City has created a community program to provide residents and businesses a streamlined, cost-effective opportunity to replace their turf lawns with water-saving landscaping and irrigation systems. Some municipal turf lawn areas (such as medians, fire stations and non-recreational park areas) have been and will continue to be converted to act as public demonstration sites and to reduce monthly water costs. The City has also established the model for water-wise landscaping for new development through an update of its Municipal Landscape Ordinance and Water Conservation Plan Guidelines.

Below is the summary as requested in the AQIP guidelines (October 2009).

***Figure 13: Summary of Village 9 Consistency with $CO_2$ Reduction Action Measures***

| Action Measure | Project/Community Design Features | Describe how project design will Implement $CO_2$ Reduction Action Measures |
|---|---|---|
| **Measure 6** (Enhanced Pedestrian Connections to Transit): Installation of walkways and crossings between bus stops and surrounding land uses. | The SPA provides a detailed Circulation Network (*Section 5.5.2*) that links with the potential transit stops. In addition *Section 5.8* provides traffic calming measures that promote pedestrian safety near the potential transit stops. | Reduces vehicle-miles traveled that in turn reduces the GHG emissions. |
| **Measure 7**: Increased Housing Density near Transit: General increase in land use and zoning designations to reach an average of at least 14-18 dwelling units per net acre within ¼ mile of major transit facilities. | The site utilization summary identifies densities of 18-45 du/ac adjacent to the potential transit stops. | Reduces vehicle-miles traveled that in turn reduces the GHG emissions. |
| **Measure 8** (Site Design with Transit Orientation): Placement of buildings and circulation routes to emphasize transit rather than auto access; also includes bus turn-outs and other transit stop amenities. | *Section 4.3.2 Urban Center Design Fundamentals and Section 4.4.2 Town Center Design Fundamentals* list the characteristics for mixed-use design: the primary emphasis of the public street elevation should be building entries and common areas while parking is to be located to the side and rear of buildings. | Promotes bicycling that can reduce vehicle-miles traveled that in turn reduces the GHG emissions. |
| **Measure 9** (Increased Land Use Mix): Provide a greater dispersion/variety of land uses such as siting of neighborhood commercial uses in residential areas and inclusion of housing in commercial and light industrial areas. | The Urban Center (UC) and Town Center (TC) zones permit a mix of residential, offices, and retail uses that allows shared parking facilities. | Reduces vehicle-miles traveled that in turn reduces the GHG emissions. |

| | | |
|---|---|---|
| **Measure 10** (Reduced Commercial Parking Requirements): Lower parking space requirements; allowance for shared lots and shared parking; allowance for on-street spaces. | Section 3.4.10 of the SPA provides for a process to create a City-approved parking agreement or district in the Urban or Town Centers. Also on-street parking is permitted on all streets except Main Street, Otay Valley Road, and Street B. | Promotes alternatives to vehicle use thereby reducing vehicle-miles traveled that in turn reduces the GHG emissions. |
| **Measure 11** (Site Design with Pedestrian/bicycle Orientation): Placement of buildings and circulation routes to emphasize pedestrian and bicycle access without excluding autos; includes pedestrian benches, bike paths, and bike racks. | *Section 4.3.2 Urban Center Design Fundamentals and Section 4.4.2 Town Center Design Fundamentals* list the characteristics for mixed-use design: building and site design anticipates and accommodates pedestrian and vehicle circulation to reduce traffic impacts on neighboring streets allowing joint optimization by pedestrians and vehicles. Buildings are oriented toward sidewalks. Bike parking is required for all uses. Street furniture is required to enhance the pedestrian environment. | Promotes bicycling and walking thereby reducing vehicle-miles traveled that in turn reduces the GHG emissions. |
| **Measure 12** (Bicycle Integration with Transit and Employment): Provide storage at major transit stops and employment areas. Encourage employers to provide showers at the place of employment near major transit nodes. | The SPA requires 1 secure space for 3 units + 10% of the vehicle parking required for each commercial use. CALGreen requires nonresidential buildings anticipated to generate visitor traffic to provide short-term bicycle racks within 200 feet of the visitors' entrance. For buildings with over 10 tenant-occupants changing/shower facilities shall be provided per CALGreen. | Promotes bicycling that can reduce vehicle-miles traveled that in turn reduces the GHG emissions. |
| **Measure 13** (Bike Lanes, paths, and Routes): Continued implementation of the City's bicycle master plan. Emphasis is to be given to separate bike paths as opposed to striping bike lanes on streets. | The SPA implements the City's bicycle master plan. The Village Pathway has been extended through the SPA with connections to Village 8 East and the Regional Technology Park and University. This 10-foot wide, paved trail runs parallel to the public roadway. Class II bikes lanes have also been provided. Some park pathways may be designed to accommodate bicycles subject to the City approval. | Promotes bicycling that can reduce vehicle-miles traveled that in turn reduces the GHG emissions. |
| **Measure 14** (Energy Efficient Landscaping): Installation of shade trees for new single-family homes as part of an overall City-wide tree planting effort to reduce ambient temperatures, smog formation, energy use, and $CO_2$. | Residential public streets will include an eight-foot parkway that includes shade trees as provided in *Section 5.6.13 Residential Streets.* | Reduces energy consumption that reduces GHG emissions. |
| **Measure 15** (Solar Pool Heating): Mandatory building code requirements for solar heating of new pools or optional motorized insulated pool cover. | ▪ Compliance with CVMC 20.04.040 that requires solar water heater preplumbing in all new residential units.<br>▪ Compliance with CVMC 20.04.040 that requires solar photovoltaic prewiring in all new residential units. | Reduces energy consumption that reduces GHG emissions. |
| **Measure 16** (Traffic Signal & System Upgrades): Provide high-efficiency LED lamps or similar as approved by the City Engineer. | Chula Vista Public Works Department is testing the use of induction/LED lighting for public streets in a pilot program. If it is determined that one of these lighting systems is feasible on a citywide basis, the applicable lighting system will be used in Village 9. | Reduces energy consumption that reduces GHG emissions. |
| **Measure 18** (Energy Efficient Building Recognition | ▪ Compliance with the updated 2008 Title | Reduces energy consumption |

| | | |
|---|---|---|
| Program): Reducing $CO_2$ emissions by applying building standards that exceed current Title 24 Energy Code requirements. | 24, part 6 energy standards.<br>▪ Compliance with CVMC Chapter 15.12 and Section 15.26.030 that requires energy efficiency standard of 15% above 2008 Title 24 Part 6 energy levels.<br>▪ Installation of the following water saving devices:<br>• Hot Water Pipe Insulation<br>• Pressure Reducing Valves<br>• Water Efficient Dishwashers (residential only)<br>• Dual Flush Toilets<br>• Water Efficient Landscape<br>▪ Installation of a recycled water system where feasible.<br>▪ Installation of energy efficient appliances such Energy Star dishwashers and Energy Star ceiling fans in each home.<br>▪ For nonresidential uses, installation an Energy Star refrigerators in grocery stores.<br>▪ Compliance with CVMC 8.25.050 that requires all generators of recyclables to separate them from refuse.<br>▪ Compliance with the Recycling and Solid Waste Planning Manual to provide for adequate space allocated to recycling and solid waste within individual projects.<br>▪ Compliance with CVMC 8.25.095 that all new construction and demolition projects divert from landfill disposal 90% of inert waste and 50% of all remaining waste generated. | that reduces GHG emissions. |
| **Measure 20** (Increased Employment Density Near Transit): General increase in land-use and zoning designations to focus employment-generating land-uses within ¼ mile of major transit stops throughout the City. | The Urban and Town Centers allow for a mix of land uses that include employment-generating land uses near the potential transit stops. | Reduces vehicle-miles traveled that in turn reduces the GHG emissions |

## 9. CREDIT TOWARDS INCREASED MINIMUM ENERGY EFFICIENCY STANDARDS

Note: Detailed provisions related to the calculation and application of credits are currently under development and subject to subsequent review and approval of City Council.
CVMC 15.26.030E provides the following:

> E. Compliance Credit Option for Buildings within Sectional Planning Area (SPA) Plan Projects. For building construction within sectional planning area (SPA) plan project areas whose SPA is approved subsequent to the effective date of the ordinance codified in this section, the developer may meet a portion of the requirements set forth under subsection (C) of this section [15% over Title 24], provided the SPA plan has met the qualifying energy savings thresholds for community design and site planning features pursuant to the requirements as set forth in the SPA's approved air quality improvement plan (AQIP). If the approved AQIP has met the qualifying thresholds, the applicant may request and receive an energy savings credit towards a portion of the requirements specified in subsection (C) of this section subject to approval by the Director of Development Services, provided the project fully complies with the 2008 Building Energy Efficiency Standards (Title 24, Part 6) which are in effect at the time of permitting, and conforms to applicable guidelines in effect at the time of the request for credit.

## 10. Compliance Monitoring

This section includes a written description and a checklist (Figure 14) summarizing the project design features and mitigation measures that have been identified to reduce Village 9's effects on air quality and improve energy efficiency.

***Figure 14: Village 9 Air Quality Improvement Plan Compliance Checklist***

| | Method of Verification[1] | Timing of Verification | Responsible Party[2] | Project Consistency & Compliance Documentation[3] |
|---|---|---|---|---|
| ***PLANNING*** | | | | |
| **AQIP Project Design Features/Principles (See Figure 12 for an expanded list)** | | | | |
| Integrated circulation system in the Urban and Town Centers (including the Village Pathway) | Plan Review | Precise Plan | City of Chula Vista | |
| Mix of uses in the Urban and Town Centers | Plan Review | Precise Plan | City of Chula Vista | |
| Higher density in the Urban and Town Centers | Plan Review | Precise Plan | City of Chula Vista | |
| Class II Bicycle facilities | Plan Check | Tentative Tract Final Map, Improvement Plans | City of Chula Vista | |
| Opportunity for employee services to be located near employers | Plan Review | Precise Plan | City of Chula Vista | |

| | | | | |
|---|---|---|---|---|
| Village circulation pattern w/less than 35mph | Plan Review | Tentative Tract Final Map, Improvement Plans | City of Chula Vista | |
| Transit Plan | Transit Review | Per SANDAG | SANDAG/City | |
| **Air Quality Mitigation Measures** | | | | |
| Construction related emissions | Permit Review | Grading Permit | City of Chula Vista | |
| Siting of sensitive land uses | Permit Review | Building Permit | City of Chula Vista | |
| ***BUILDING*** | | | | |
| **Green Building Standards** | | | | |
| New Construction Recycling Plan | Waste Management Report Review | Construction or demolition permit | City of Chula Vista | |
| Space of recycling in projects | Plan Check | Tentative Tract OR Building Permit | City of Chula Vista | |
| **Energy Efficiency Standards** | | | | |
| Size of dwellings units | Plan Check | Building Permit | City of Chula Vista | |
| Orientation of Urban and Town Centers | Plan Check | Tentative Tract Final Map, Improvement Plans | City of Chula Vista | |
| Building comply with 15% above 2008 Title 24 Part 6 energy levels. | Plan Check | Building Permit/ Title 24 Energy Report | City of Chula Vista | |
| Installation of energy efficient appliances | Plan Check | Building Permit | City of Chula Vista | |
| Indoor water fixture requirements:<br>▪ Hot Water Pipe Insulation<br>▪ Water Efficient Dishwashers (residential only)<br>▪ Dual Flush Toilets | Plan Check | Plumbing Permit | City of Chula Vista | |
| Installation of Pressure Reducing Valves | Plan Check | Plumbing Permit | Otay Water District | |
| Landscape Water Conservation | Plan Check | Landscape Plan | City of Chula Vista | |
| Installation of Recycled Water for street parkway landscape, parks, manufactured slopes and landscape common areas of commercial and multi-family residential sites. | Plan Check | Tentative Tract Final Map, Improvement Plans | Otay Water District/ City of Chula Vista | |

Notes:

1. Method of verification may include, but is not limited to, plan check, permit review, site inspection.
2. Identify the party responsible for ensuring compliance (City of Chula Vista, San Diego APCD, Other)
3. This column shall include all pertinent information necessary to confirm compliance including document type, date of completion, plan/permit number, special notes/comments, and contact information.